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1

㊴特許請求の範囲

1　貫通型無結節網であつて、各々の網脚を構成する2本のストランドは組節部を2つ通過する毎にお互相互の撚りによる網脚の撚り方向が変わり、左撚り網脚による網目と、右撚り網脚と左撚り網脚とによる網目と、右撚り網脚による網目で構成されたことを特徴とする無結節網。

発明の詳細な説明

本発明は、無結節網に関する。

従来の無結節網はストランド2本を主体とし、これを全て同方向に撚合わせ脚を構成しているために上下脚のバランスが取り難く、右或は左の何れかのトルクが勝ち網が波状に振れる欠点を持つており、後加工により熱セットしバランスをとつているのが現状である。

然し乍らセツト効果の面から網の振れが完全には解消されず製作面で撚数を決定するのに種々調節を行ない如何にバランスの取れた網を作るか苦心する所であるが機械上的に狙う面が多々あり労力を要していた。

これが改良の試みとして特許第29190号山本編網なる発明があるが、これはその特許明細書並に同図面の通り左撚り糸（網脚）数条よりなる無結節網部分と、右撚り糸（網脚）数条よりなる無結節網部分とよりなり、この両種の網の境界部は千鳥型組節となつて折り返へし両種の網を構成する糸即ち異つた撚り方向の糸は互に混在しない構成となつている。

2

そのために右又は左撚り網脚のみよりなる各々の網部分については従来の欠点は改善されておらずまた千鳥型組節部は網脚を構成するストランドの流れが組節部で折返しとなるために貫通型組節部に比し引張り強度が劣り、また組節部が大きくなりやすい欠点を有するために特許第29190号山本編網は実用化されていない。

本発明はこれを解消するために当互のトルクを打消すように異なる撚方向の脚で網目を形成し、安定した網を供給せんとするものである。

本発明は、これ等の欠点を解消するために第3図に示す如く右撚り網脚による網目と、左撚り網脚による網目とを並行隣接させると共に各々1つの網脚を構成する2本のストランド同志では、組節部2つを形成する毎にお互の撚り方向を変へ、即ち第3図で各ストランドの流れである方向イ～ロ、或はハ～ニの方向で網脚は組節2つ目ごとにその網脚撚り方向を変じさせた貫通型無結節網である。

第1図は3輪を基礎単位とした組配置を示す。即ち従来のものを1とすると4/3＝1.33倍の網巾が可能である。同図及び第2図は組節時の軌跡を示しものであるが、例えば第1図を外の組とすれば第2図は中の組の軌跡である。

第3図は第1，2図によつて網を構成した時の脚の撚方向を示すものでその詳細は上述した通りである。

第4図は渡り部の運転輪に3輪を基礎単位とし

て錘を配置した1事例である。

このように、従来の無結節網を編組する製網機に於ては、網脚のストランド錘を右回転、左回転、右回転……の配列となつている運動輪の同一方向回転分にのみ、即ち1ケ置きの運動輪にのみ配置するのに対し、本発明では逆回転輪にも配置し得るので同一規模の機械ではより多くの錘を配置し網目仮数を増すことが可能であり、また同一網目仮数の網に対しては機械を小型化できると云う製網効率上の利益も大きい。また同上の理由、即ち錘配置のピツチを小さくできることにより従来よりも細目の網の製作も可能である。

また本発明を組節に利用するための編組製網機の運動輪へのストランド錘の配置と、これの進行軌跡を第1図及び第2図に示す。

何れも3輪を単位として網脚2本が形成され、組節部を第1図では9工程、第2図では11工程により組節を行うものである。

機械の運動輪の配列の折り部分の配錘を第4図に示す。

上述のように本発明は、網地全体に右撚り網脚

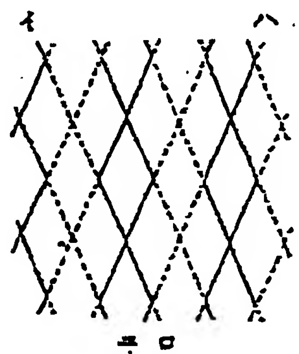
による網目と、左撚り網脚による網目が均等に分布され、即ち左撚り網脚と、右撚り網脚が等量に分布されておるために網地の振れ、変形、歪みを生ぜず平滑をよく保ち得る。この事は製網作業、網の仕立て作業、敷設作業に於て従来網に比較して勝れた特徴を有するものである。

また貫通型であるために組節部の形状、網の強度も上述の先行例のような欠点を有しない。また網に強い張力が作用しても網脚を構成する2本のストランドの組合わせの撚り方向の右、左撚り部分の長さが均衡しており捩れ等を生ずることがなく、特に漁網として使用した場合常に安定した網合が保ち得られ漁獲効率の向上が計りうるなど優れた特長を有する。

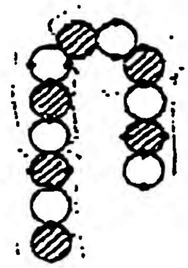
図面の簡単な説明

第1図及第2図は3輪を基礎単位とした錘配置及組節時の軌跡図、第3図は同上軌跡により編組された網の脚の撚方向の違いを示した説明図、第4図は折り部の3輪を単位とした錘配置図である。

第3図



第4図



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KNOTLESS NET

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(57) **Claims**

1 A knotless net which is characterized by the fact that in a pass-through type knotless net, the two strands which constitute each net leg are arranged so that the twist direction of the net legs depending on the mutual twisting of said strands changes at every second connecting node part where said strands form a connecting node, thus forming a net which is made up of net openings formed by left-twisted net legs, net openings formed by both right-twisted net legs and left-twisted net legs, and net openings formed by right-twisted net legs.

Detailed Description of the Invention

The present invention concerns a knotless net.

In conventional knotless nets, the main body of the net consists of two strands, and these strands form legs which are all twisted in the same direction. As a result, such conventional knotless nets suffer from the following drawback: i. e., it is difficult to achieve a balance between up-twisting and down-twisting, so that either a left-handed or right-handed torque tends to prevail, thus causing the net to twist in the form of a rod [?] [poor legibility--Tr.]. Accordingly, it is currently the practice in the case of such nets to obtain a balance by performing thermal setting in an after-treatment process.

However, the twisting of the net is not completely eliminated by the abovementioned setting effect; accordingly, in the manufacturing process, various adjustments are made in order to determine number of twists, and painstaking efforts are made in an attempt to somehow manufacture a balanced net. Many aspects of this process depend on a sense of the mechanisms involved, and a considerable expenditure of effort is required.

Past attempts to solve this problem include the invention of the Yamamoto net [?] [personal name?--Tr.] described in Patent No. 29190. As is shown in the specification and drawings of the abovementioned patent, this net has a construction consisting of knotless net portions which consist of several left-twisted filaments (net legs) and knotless net portions which consist of several right-twisted filaments (net legs); in this construction, the boundary area between the two types of net construction is turned back in the form of cross-stitched nodes so that there is no mixing of the filaments making up the two net types, i. e., the filaments with different twist directions.

As a result, the abovementioned conventional drawbacks are not ameliorated in the respective net portions consisting only of right- or left-twisted net legs; furthermore, cross-stitch type connecting node parts are inferior to pass-through type connecting node parts in terms of tensile strength, since the flow of the strands making up the net legs is turned back at the connecting node parts. Furthermore, such a net suffers from an additional drawback in that the size of the connecting nodes tends to be increased. Accordingly, the Yamamoto net of Patent No. 29190 has not yet been adapted for practical use.

In order to solve this problem, the present invention provides a net which is stabilized by the formation of net openings by legs with different twist directions, so that the torques of said legs cancel each other.

In order to eliminate the abovementioned drawbacks, the present invention provides a pass-through type knotless net in which [a] net openings formed by right-twisted net legs and net openings formed by left-twisted net legs are positioned adjacent to each other, and [b] the mutual twist directions of the two strands making up each net leg are changed at every second connecting node part formed by said net legs (as shown in Figure 3), i. e., the net legs oriented in the direction a-b or direction c-d in which the respective strands run in Figure 3 are arranged so that the twist direction of said net legs is caused to change at every second connecting node.

Figure 1 shows a spindle arrangement in which three rings are taken as the basic unit. Specifically, if a conventional attachment width [lit. trans.--Tr.] is taken as 1, an attachment width of 4/3 = 1.33 times is possible in this case. Figures 1 and 2 show the tracks of the spindles during node formation. For example, if Figure 1 is taken as the outside set [sic], then Figure 2 shows the tracks of the inside set.

Figure 3 shows the twist directions of the legs in the case of a net formed as indicated in Figures 1 and 2. The details of this arrangement are as described above.

Figure 4 shows one example of the arrangement of spindles on the spindle carrying rings in the cross-over part, with three rings taken as the basic unit.

Thus, in the net-making machine used to knit a conventional knotless net, the strand spindles for the net legs are installed only on those spindle carrying rings (arranged in a configuration of right rotation, left rotation, right rotation and so on) that rotate in the same direction, i. e., said spindles are installed on every other spindle carrying ring. In the present invention, on the other hand, the abovementioned spindles can also be installed on rings rotating in the opposite direction. Accordingly, in a machine of the same size, a larger number of spindles can be installed, so that the number of net openings can be increased. Alternatively, in the case of a net with the same number of openings, the size of the machine required can be reduced, which is very advantageous from the standpoint of net-making efficiency. Furthermore, for the same reason, it is also possible to manufacture nets which are finer than conventional nets by reducing the installation pitch of the spindles.

Moreover, the installation of strand spindles on the spindle carrying rings of the knitting type net-making machine used to manufacture the net of the present invention, and the movement tracks of said strand spindles, are shown in Figures 1 and 2.

In both cases, two net legs are formed with three rings taken as the basic unit. In Figure 1, the connecting node parts are formed by 9 processes, while in Figure 2, the connecting node parts are formed by 11 processes.

The installation of spindles in the cross-over portion of the spindle carrying ring arrangement of the machine is shown in Figure 4.

Thus, in the present invention, net openings formed by right-twisted net legs and net openings formed by left-twisted net legs are uniformly distributed throughout the net material as a whole, i. e., left-twisted net legs and right-twisted net legs are distributed in equal amounts, so that no twisting, deformation or strain is generated in the net material, and the net material can be maintained in a flat state. This special feature makes the net of the present invention superior to conventional nets from the standpoint of net manufacturing work, net finishing work and net installation work.

Furthermore, since the net of the present invention is a pass-through type net, the shape of the connecting node parts and the strength of the net are also free of the drawbacks seen in the abovementioned conventional examples. Moreover, since the lengths of the right- and left-twisted portions of the combinations of two strands making up each net leg are balanced, no twisting habit is formed even if a strong tension is applied to the net. Thus, the net of the present invention offers superior special features: for example, especially in cases where the net of the present invention is used as a fishing net, stable net openings can be maintained so that the efficiency of fish capture can be improved, etc.

Brief Explanation of the Figures

Figures 1 and 2 are diagrams which show the installation of spindles and the movement tracks during node formation, with three rings taken as the basic unit. Figure 3 is an explanatory diagram which shows the difference in the twist direction of the legs of a net knitted using the abovementioned tracks. Figure 4 is a diagram which shows the installation of the spindles in the cross-over area, with three rings taken as the basic unit.